

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-2. (Canceled).

3. (Currently Amended) Apparatus for enhanced and controlled delivery of a biologically active agent into the spinal structures and/or the brain of a mammal, ~~particularly a human being~~ that circumvents the blood brain barrier, comprising:

an agent drug delivery device ~~implantable~~ implanted via catheter to the epidural space of the mammal in use,

a donor iontophoresis electrode also ~~implantable~~ implanted to the epidural space of the mammal in use,

a receptor iontophoresis electrode that is constructed and arranged to be positioned at a determined internal or external position of the mammal's body but in complementary energy gradient positioning to the ~~[[first]]~~ donor electrode,

~~means for providing a power source to deliver~~ a potential gradient so that delivery of the biologically active agent is accomplished in a direction from said ~~[[first]]~~ donor electrode ~~[[means]]~~ directly into the spinal structures and/or the brain thereby essentially bypassing the blood brain barrier of the mammal, and thereby

delivering said biologically active agent to the spinal structures and/or to the brain of said mammal.

4. (Currently Amended) Apparatus for enhanced and controlled delivery of a biologically active agent into the spinal structures and/or the brain of a mammal, ~~particularly a human being~~ that circumvents the blood brain barrier, comprising:

an agent drug delivery device ~~implantable~~ implanted via catheter to the epidural space of the mammal in use,

a phonophoresis device ~~implantable~~ implanted to the epidural space of the mammal in use,

~~means for providing a power source to deliver a potential gradient so that delivery of the~~ biologically active agent is accomplished in a direction from said phonophoresis device directly into the spinal structures and/or the brain thereby essentially bypassing the ~~the~~ blood brain barrier of the mammal, and thereby

delivering said biologically active agent to the spinal structures and/or to the brain of said mammal,

wherein the phonophoresis device includes an impermeable part, a drug transfer part and a piezoelectric transducer between the impermeable part and the drug transfer part, to induce agent delivery in a direction from the impermeable part to a drug transfer surface of the drug transfer part.

Claims 5-6. (Canceled).

7. (Original) Apparatus as claimed in claim 3 wherein the donor electrode includes a drug reservoir or drug transfer part for storage of the biologically active agent, an impermeable part that is not involved in drug transfer, and an electroconductive member.

8. (Currently Amended) Apparatus as claimed in claim 3 wherein the donor electrode ~~includes a mean for expansion~~ is expandable thereby allowing the drug reservoir or transfer part to make an intimate contact with the dura mater.

9. (Currently Amended) Apparatus as claimed in claim 8 wherein the ~~expansion means donor electrode~~ is configured to expand the donor electrode ~~be expandable~~ in a direction substantially radial thereby promoting an improved contact interface between the drug reservoir or transfer part and the dura mater.

10. (Currently Amended) Apparatus as claimed in claim ~~[[9]]~~ 3 wherein a conductor of the expansion means is a donor electrode is dynamically movable with an expandable balloon.

11. (Currently Amended) Apparatus as claimed in claim 8 wherein the ~~expansion means is provided by reversible swelling properties of the drug reservoir or transfer part~~ is provided with a reverse swelling property that is induced by chemical or physical changes such as for example, electric current, pH, temperature or any combinations thereof.

12. (Currently Amended) Apparatus as claimed in claim 8 wherein the drug delivery ~~part of the device~~ is shaped following expansion according to the human epidural space.

13. (New) Apparatus as claimed in claim 11, wherein the chemical or physical changes include electric, current, pH, temperature or any combination thereof.

14. (New) Apparatus as claimed in claim 10, wherein the conductor of the donor electrode covers and is positioned radially outwards of the balloon in medial respects.

15. (New) Apparatus as claimed in claim 3, wherein the donor electrode includes an impermeable part that controls delivery of the active agent to only a limited circumferential extent of the donor electrode.

16. (New) Apparatus as claimed in claim 3, wherein the donor electrode includes an expandable drug transfer surface to allow unidirectional expansion towards the dura mater.

17. (New) Apparatus as claimed in claim 7, wherein the drug transfer part is configured to deliver the agent in a direction from said impermeable part towards a drug transfer surface of the drug transfer part.

18. (New) Apparatus as claimed in claim 3, further comprising a biosensor connected to the power control unit for feedback regulated delivery of the biologically active agent to the spinal structures and/or the brain of a mammal.

19. (New) Apparatus as claimed in claim 18, wherein the biosensor is adapted to register biopotentials for feedback regulated delivery of a biologically active agent in the treatment of chronic pain, hyperkinesia or any other pathological symptoms or diseases.

20. (New) Apparatus as claimed in claim 3, wherein the receptor electrode includes an electrolyte-containing compartment for storage of electrolyte, an electroconductive member and a membrane through which electrolyte transport occurs.

21. (New) Apparatus according to claim 3, further comprising structure to allow in situ refilling of said device.

22. (New) Apparatus according to claim 3, wherein said donor and receptor electrodes comprise an electroconductive part having electroconductive material selected from the following group; stainless steel, gold, silver, titanium, copper, zinc, graphite and metal salts.

23. (New) Apparatus according to claim 3, wherein said donor and/or receptor electrode includes a reservoir formed of a polymer matrix containing an electroconductive filler material selected from the group consisting of a metal powder, powdered graphite and carbon fibers.

24. (New) Apparatus according to claim 23, wherein said reservoir is constructed of material that is adapted to absorb, hold and release the biologically active agent and/or electrolyte.

25. (New) Apparatus according to claim 23, wherein said reservoir is made of a hydrogel that holds the biologically active agent and/or electrolyte.